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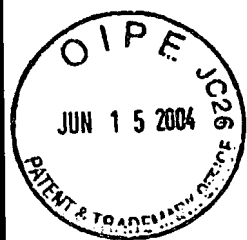
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Hansong Zhang

Appl. No.: 09/923,398

Filed: August 8, 2001

For: **Method, System, and Computer  
Program Product for Visibility  
Culling of Terrain**

Confirmation No.: 2363

Art Unit: 2671

Examiner: Nguyen, Phu K.

Atty. Docket: 2198.010000

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**First Supplemental Information Disclosure Statement**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

Listed on accompanying Form PTO-1449 are documents that may be considered material to the examination of this application, in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98. The numbering on this First Supplemental Information Disclosure Statement is a continuation of the numbering in Applicant's Information Disclosure Statement filed on February 15, 2002 in connection with the above-captioned application.

Applicant has listed publication dates on the attached PTO-1449 based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicant reserves the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Applicant has checked the appropriate boxes below.

- ☐ 1. Statement under 37 C.F.R. 1.704(d). Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty days prior to the filing of this information disclosure statement.
- ☒ 2. Filing under 37 C.F.R. § 1.97(b). This Information Disclosure Statement is being filed within three months of the date of filing of a national application other than a continued prosecution application (CPA), OR within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, OR before the mailing date of a first Office Action on the merits OR before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No statement or fee is required.
- ☐ 3. Filing under 37 C.F.R. § 1.97(c). This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application.

- ☐ a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).
- ☐ b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).
- ☐ c. Attached is our PTO-2038 Credit Card Payment Form in the amount of \$\_\_\_\_\_ in payment of the fee under 37 C.F.R. § 1.17(p).
- ☐ 4. Filing under 37 C.F.R. § 1.97(d) This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. Enclosed find our PTO-2038 Credit Card Payment Form in the amount of \$\_\_\_\_\_ in payment of the fee under 37 C.F.R. § 1.17(p); in addition:
- ☐ a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign

application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).

- ☐ b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

- ☐ 5. The document(s) was/were cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided in satisfaction of the requirement for a concise explanation of relevance. 1138 OG 37, 38.

- ☐ 6. A concise explanation of the relevance of the non-English language document(s) appears below:

- ☒ 7. Copies of the documents are submitted herewith.

- ☐ 8. Copies of the documents were cited by or submitted to the Office in an IDS that complies with 37 C.F.R. § 1.98(a)-(c) in Application No. \_\_\_\_\_, filed \_\_\_\_\_, which is relied upon for an earlier filing date under 35 U.S.C. § 120. Thus, copies of these documents are not attached. 37 C.F.R. § 1.98(d).

- ☐ 9. No copies of U.S. patents and patent application publications cited on the attached Form PTO-1449 are submitted in accordance with 1276 OG 55 because this application was filed after June 30, 2003.
- ☐ 10. It is expected that the examiner will review the prosecution and cited art in the parent application no(s). \_\_\_\_\_ in accordance with MPEP 2001.06(b), and indicate in the next communication from the office that the art cited in the earlier prosecution history has been reviewed in connection with the present application.

It is respectfully requested that the Examiner initial and return a copy of the enclosed PTO-1449, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Kendrick P. Patterson  
Attorney for Applicant  
Registration No. 45,321

Date: June 15, 2004

1100 New York Avenue, N.W.  
Washington, D.C. 20005-3934  
(202) 371-2600

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FORM PTO-1449

## INFORMATION DISCLOSURE STATEMENT

ATTY. DOCKET NO.  
2198.0100001 (as amended)APPLICATION NO.  
09/923,398FIRST NAMED INVENTOR  
Hansong ZhangFILING DATE  
August 8, 2001ART UNIT  
2671

## U.S. PATENT DOCUMENTS

| EXAMINER<br>INITIAL | DOCUMENT<br>NUMBER | DATE | NAME | CLASS | SUB-CLASS | FILING DATE |
|---------------------|--------------------|------|------|-------|-----------|-------------|
|                     | AA1                |      |      |       |           |             |
|                     | AB1                |      |      |       |           |             |
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|                     |                    |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |
|                     | AL1                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |
|                     | AM1                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |
|                     | AN1                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |
|                     | AO1                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |
|                     | AP1                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |   |   |
|----|---|---|
| AR | 1 | Cabral, B., et al., "Bidirectional Reflection Function from Surface Bump Maps," <i>Computer Graphics Proceedings, Annual Conference Series - SIGGRAPH '87</i> 21(4):273-281, Association for Computing Machinery, New York (July 1987). |
| AS | 1 | Cohen-Or, D. and Shaked, A., "Visibility and Dead-Zones in Digital Terrain Maps," <i>Eurographics 95</i> , 14(3):171-180, Blackwell Publishers (1995).  |
| AT | 1 | Crocetta, L., et al., "Visibility in Digital Terrain Maps: A Fuzzy Approach," <i>14<sup>th</sup> Spring Conference on Computer Graphics</i> , pp. 257-266, Comenius University, Bratislava, Slovakia (April 1998).                      |

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DATE CONSIDERED

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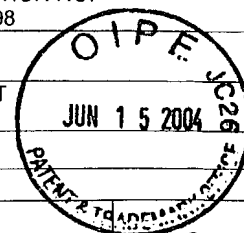
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|                     | AL2                |      |         |       |           | Yes<br>No   |
|                     | AM2                |      |         |       |           | Yes<br>No   |
|                     | AN2                |      |         |       |           | Yes<br>No   |
|                     | AO2                |      |         |       |           | Yes<br>No   |
|                     | AP2                |      |         |       |           | Yes<br>No   |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |   |   |
|----|---|---|
| AR | 2 | De Floriani, L. and Magillo, P., "Algorithms for Visibility Computation on Digital Terrain Models," <i>Proceedings ACM Symposium on Applied Computing '93</i> , pp. 380-387, Association for Computing Machinery, New York (February 1993). |
| AS | 2 | De Floriani, L. and Magillo, P., "Computing Visibility Maps on a Digital Terrain Model," <i>Spatial Information Theory - A Theoretical Basis for GIS</i> , pp. 248-269, Springer-Verlag, Berlin, Germany (1993).                            |
| AT | 2 | De Floriani, L. and Magillo, P., "Visibility Algorithms on Triangulated Digital Terrain Models," <i>International Journal of Geographic Information Systems</i> 8(1):13-41, Taylor & Francis Ltd., London, England (January-February 1994). |

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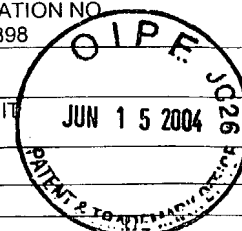
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|                     | AL3 |                    |      |         |       |           | Yes<br>No   |
|                     | AM3 |                    |      |         |       |           | Yes<br>No   |
|                     | AN3 |                    |      |         |       |           | Yes<br>No   |
|                     | AO3 |                    |      |         |       |           | Yes<br>No   |
|                     | AP3 |                    |      |         |       |           | Yes<br>No   |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |          |  |
|----|----------|--|
| AR | <u>3</u> | De Floriani, L. and Magillo, P., "Horizon Computation on a Hierarchical Triangulated Terrain Model," <i>The Visual Computer</i> 11(3):134-149, Springer-Verlag (1995).   |
| AS | <u>3</u> | Greene, N., et al., "Hierarchical Z-Buffer Visibility," <i>Computer Graphics Proceedings, Annual Conference Series - SIGGRAPH 93</i> , pp. 231-238, Association for Computing Machinery, New York (August 1993). |
| AT | <u>3</u> | Lee, C.-H. and Shin, Y.G., "An Efficient Ray Tracing Method for Terrain Rendering," <i>Pacific Graphics '95</i> , pp. 180-193 (August 1995).   |

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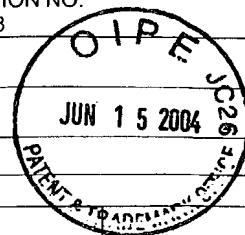
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|                     | AL4 |                    |      |         |       |           | Yes<br>No   |
|                     | AM4 |                    |      |         |       |           | Yes<br>No   |
|                     | AN4 |                    |      |         |       |           | Yes<br>No   |
|                     | AO4 |                    |      |         |       |           | Yes<br>No   |
|                     | AP4 |                    |      |         |       |           | Yes<br>No   |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |          |   |
|----|----------|---|
| AR | <u>4</u> | Max, Nelson L., "Shadows for Bump-Mapped Surfaces," <i>Advanced Computer Graphics - Proceedings of Computer Graphics Tokyo '86</i> , pp.144-156, Springer-Verlag, (1986). |
| AS | <u>4</u> | Max, Nelson L., "Horizon Mapping: Shadows for Bump-Mapped Surfaces," <i>The Visual Computer</i> 4(2):109-117, Springer-Verlag, Berlin, Germany (July 1988).               |
| AT | <u>4</u> | Stewart, A. James, "Hierarchical Visibility in Terrains," <i>Eurographics Rendering Workshop</i> 1997, pp. 217-228, Springer, Vienna, Austria (1997).                     |

EXAMINER

DATE CONSIDERED

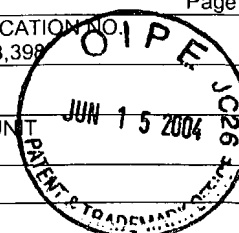
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|                     | AL5                |      |         |       |           | Yes         |
|                     | AM5                |      |         |       |           | No          |
|                     | AN5                |      |         |       |           | Yes         |
|                     | AO5                |      |         |       |           | No          |
|                     | AP5                |      |         |       |           | Yes         |
|                     |                    |      |         |       |           | No          |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |   |  |
|----|---|--|
| AR | 5 | Stewart, James A., "Fast Horizon Computation at All Points of a Terrain With Visibility and Shading Applications," <i>IEEE Transactions on Visualization and Computer Graphics</i> 4(1):82-93, IEEE (January-March 1998).                    |
| AS | 5 | Teller, S.J. and Sequin, C.H., "Visibility Preprocessing For Interactive Walkthroughs," <i>Computer Graphics Proceedings, Annual Conference Series - SIGGRAPH '91</i> 25(4):61-69, Association for Computing Machinery SIGGRAPH (July 1991). |
| AT | 5 | Trobec, T. et al., "Calculation of Visibility from Raster Relief Models," <i>14<sup>th</sup> Spring Conference on Computer Graphics</i> , pp. 257-266, Comenius University, Bratislava, Slovakia (April 1998).                               |

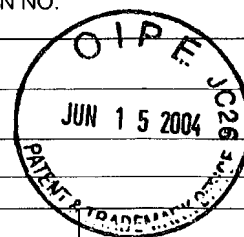
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|                     | AM6 |                    |      |         |       |           | Yes<br>No   |
|                     | AN6 |                    |      |         |       |           | Yes<br>No   |
|                     | AO6 |                    |      |         |       |           | Yes<br>No   |
|                     | AP6 |                    |      |         |       |           | Yes<br>No   |

## OTHER (Including Author, Title, Date, Pertinent Pages, etc.)

|    |          |  |
|----|----------|--|
| AR | <u>6</u> | Zhang, H. <i>et al.</i> , "Visibility Culling Using Hierarchical Occlusion Maps," <i>Computer Graphics Proceedings, Annual Conference Series - SIGGRAPH '97</i> , pp. 77-88 (August 1997). |
| AS | <u>6</u> |  |
| AT | <u>6</u> |  |

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